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Checking of Exterior Paints

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Standard Method of EVALUATING DEGREE OF RESISTANCE TO CHECKING OF EXTERIOR PAINTS¹

This Standard is issued under the fixed designation D 660; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval.

1. Scope

1.1 The photographic reference standards included in this method are representative of degrees of resistance to checking of exterior paint films. These standards are primarily intended for comparative evaluation.

2. Definition

2.1 *checking*—that phenomenon manifested in paint films by slight breaks in the film that do not penetrate to the underlying surface. The break should be called a crack² if the underlying surface is visible. Where precision is necessary in evaluating a paint film, checking may be described as visible (as seen with the naked eye) or as microscopic (as observed under a magnification of 10 diameters).

3. Types of Checking

3.1 Three types of checking are recognized:

3.1.1 *Irregular Pattern Type*—Checking in which the breaks develop in the surface of the film in no definite pattern.

3.1.2 *Line Type*—Checking in which the breaks in the surface of the film are generally arranged in parallel lines, usually either horizontally or vertically, over the surface of the film. These breaks often follow the line of brush marks.

3.1.3 *Crowfoot Type*—Checking in which the breaks in the surface of the film form in a definite three-prong pattern with the breaks running from a center and forming an angle of about 120 deg between the prongs.

4. Use of Photographic Reference Standards

4.1 The use of the photographic reference standards³ shown in Fig. 1 requires the following precautions:

4.1.1 The accompanying photographic reference standards show line-type checking only. Crowfoot and irregular-type checking may also be interpreted from the photographs.

4.1.2 Care must be taken not to confuse various types of failure that may be present on the same surface.

4.1.3 It must be realized that the degree of failure will vary over any given area. Therefore, an average portion of the film should be used for comparison.

4.1.4 Paint films may collect excessive quantities of dirt, which may mask the type and degree of failure. If necessary dirt should be removed by careful and gentle brushing with a moderately soft brush.

4.1.5 The use of a microscope is recommended to detect and evaluate incipient checking.

4.1.6 The No. 8 standard must be examined closely under adequate lighting conditions to

¹ This method is under the jurisdiction of ASTM Committee D-1 on Paint, Varnish, Lacquer, and Related Products.

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² For evaluation of cracking, see ASTM Standard Method D 661, Evaluating Degree of Resistance to Cracking of Exterior Paints, which appears in this publication.

³ Copies of the Exposure Standards Manual prepared by the Federation of Societies for Paint Technology, giving actual photographs of various types of failures of exterior paints, may be obtained from the Secretary of the Federation, 121 South Broad St., Philadelphia, Pa. 19107.

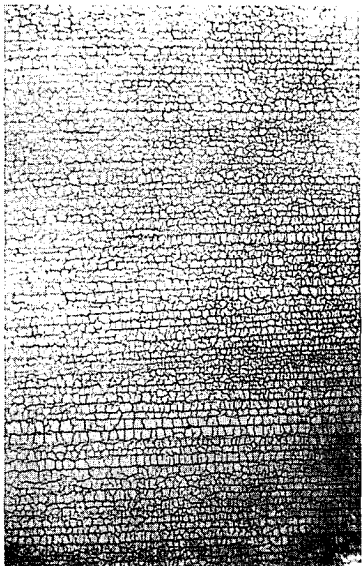
distinguish the failure present. For the sake of clarity, a 10-diameter magnification of No. 8 checking is shown in Fig. 2, as well as the unmagnified view shown in Fig. 1.

4.1.7 For convenience in recording the data obtained, the records may be kept on forms such as ASTM Standard D 1150, Single and Multi-Panel Forms for Recording Results of

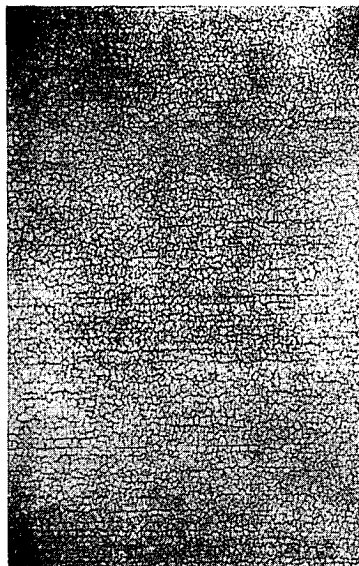
Exposure Tests of Paints.^{4,5}

⁴ 1974 Annual Book of ASTM Standards, Part 27.

⁵ These record sheets may be obtained from the American Society for Testing and Materials, 1916 Race St., Philadelphia, Pa. 19103 (request Adjunct No. 12-411500-11 and 12-411500-21), and from the Federation of Societies for Paint Technology, 121 S. Broad St., Philadelphia, Pa. 19107.



No. 8



No. 6



No. 4



No. 2

FIG. 1 Degrees of Checking.



FIG. 2 No. 8 Checking Magnified 10 Diameters.

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